International Journal of Business
Management & Research (IJBMR)
ISSN (P): 2249-6920; ISSN (E): 2249-8036
Vol. 9, Issue 3, Jun 2019, 19-34
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THE IMPACT OF MONETARY POLICY ON FINANCIAL INCLUSION IN NIGERIA (1981-2016)

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ABSTRACT

Despite the recent growth in financial sector and the fact that countries around the world have successfully used their monetary policies to drive their financial inclusion initiatives, many individuals are still excluded from access to formal financial services in Nigeria. This study analyzed the impact of monetary policy indicators on financial inclusion in Nigeria (1981-2016).

The time series data used for the study were gathered through secondary sources from the Central Bank of Nigeria, The Global Findex, The IMF Financial Access Survey (FAS), and World Bank's Global Payment Survey. Data were collected on financial inclusion indices such as total deposit of rural banks, total loans of rural banks, total number of commercial bank branches, number of Automated Teller Machines (ATM) per 100,000 adults, the ratio of money supply to gross domestic product. Data were also collected on Monetary Policy Transmission Channels as Money Supply, Monetary Policy Rate, Liquidity Ratio and Prime Lending Rate. Multiple Regression and Cointegration and Error Correction Model were used to analyze the relationship between monetary policy transmission mechanisms and financial inclusion indices and also investigate the monetary policy indicator affecting financial inclusion most during the period under survey.

Findings revealed significant relationships between money supply and total loan of rural banks, a number of bank branches, and the number of ATMs per 100,000 adults. The regressed standard errors were very low and the coefficient of multiple determination (R^2) was 0.56. The result of the effect of monetary policy on financial inclusion showed an adjusted R^2 of 0.51 and Durbin Watson was 1.6; The t statistics of the coefficient of Money Supply (MP_2) was 5.55 and that of Liquidity Ratio (MP_3) was 5.91; Also liquidity ratio was the monetary policy variable that affected financial inclusion most during the period under review. Based on the outcome of this study, we recommended among others that Central Bank of Nigeria (CBN) should introduce adoption of differentiated liquidity ratio for banks with more rural branches as a way of encouraging the deposit money banks that are promoting financial inclusion.

KEYWORDS: Monetary Policy, Financial Inclusion & Financial Sector

Received: Mar 22, 2019; **Accepted:** Apr 12, 2019; **Published:** May 06, 2019; **Paper Id.:** IJBMRJUN20193

Original Article

1.0. INTRODUCTION

Banking and other financial institutions have shown tremendous growth in volume and complexity during the last few decades in Nigeria. Despite the significant improvements in all the areas relating to financial viability, profitability and competitiveness, there are concerns that the financial sector has not been able to include vast

segment of the population, especially the underprivileged sections of the society, into the fold of basic financial services.

One of the common features of the economic environment in many emerging markets and developing economies is limited access to the formal financial sector. Data from the World Bank suggest that 50% of adults globally did not have an account at a formal financial institution in 2011 based on a survey of household in 148 economies (Demirguc-Kunt and Thorsten 2012).

Financial inclusion has therefore continued to assume increasing recognition across the globe among policy makers, researchers and development oriented agencies. Its importance derives from the promise it holds as a tool for economic development, particularly in the areas of poverty reduction, employment generation, wealth creation and improving the welfare and general standard of living.

The Central Bank of Nigeria and other stakeholders in financial inclusion desire to implement National Financial Inclusion Strategy that will reduce the percentage of adult Nigerians that are excluded from financial services by the year 2020. The financial inclusion strategy has been designed in various ways to support the core mandates of the Central Bank of Nigeria. For instance, the mandate of ensuring monetary and price stability is to be addressed by influencing savings, investment and consumption behavior through interest and exchange rates changes. According to (CBN 2018), Nigeria is not on track to meet the 2020 targets set out in the National Financial Inclusion Strategy (NFIS) of 2012. The NFIS set two financial inclusion targets for the year 2020: an overall financial inclusion rate of 80% of the adult population and a formal financial inclusion rate of 70% of the adult population. As of 2016, just 58.4% of Nigeria's 96.4 million adults were financially served and only 48.6% of all adults used formal financial services.

Financial Inclusion strategy is expected to support Central Bank's mandate of issuance of legal tender currency by increasing the penetration of electronic payment usage and cash-less efforts aiming at reducing the cost of cash management and the cost of issuing legal tender currency. The CBN believes that financial inclusion is imperative for economy growth process because as more people are brought into the formal financial system, it will help in proper planning and decision making with more reliable data. It also assists to reduce the volume of money outside the banking sector. This should be useful for monetary policy decisions by the government and its agencies.

Some countries around the world have successfully used their monetary policies to drive their financial inclusion initiatives forward. For example, banks have been mandated by the monetary policy statement to have a minimum number of branches in rural or semi-urban areas. Mbutor and Uba (2013) equally maintained that financial inclusion is expected to make monetary policy more effective by eliminating the need for the informal sector, which tends to interfere with the impact of monetary policy.

1.1. Statement of the Research Problem

Despite the recent growth in financial sector in Africa and the fact that countries around the world have successfully used their monetary policies to drive their financial inclusion initiatives, many individuals are still excluded from access to formal financial services.

Over the past few years, the Central Bank of Nigeria (CBN) introduced a number of policies aimed at enhancing financial inclusion in Nigeria such as, including policies around microfinance, mobile payments, Know Your Customer (KYC), electronic payments, bank charges, non-interest banking, and agent banking. As early as 2005, CBN released various policies to encourage the expansion of the formal financial sector toward informally banked and unbanked

customers. For example, the tiered KYC regulations (2013) specified guidelines for customer identification, loan assessment, and credit thresholds for low-income customers, with the intent to encourage financial inclusion. The CBN also regulated bank charges, agent-bank relationships, microfinance and deposit money bank operations, and mobile payments with similar considerations in mind. Nigeria's deposit money banks, microfinance banks, mobile money operators, and myriad of informal actors all play in the financial services space, with heterogeneous product offerings that remain largely focused on transfer, credit, and savings options. Unfortunately, the policies governing these services operate in a complex ecosystem of both financial sophistication and basic need.

According to Adigun and Kama (2013), financial exclusion has manifested prominently in Nigeria with the bulk of the money in the economy staying outside the banking system. Prior to the recent efforts to promote financial inclusion, the Nigerian economy was largely a cash-based economy with significant proportion of the narrow money stock in the form of currency outside the banking system.

Consequent upon the huge volume of cash outside the banking system, the Central Bank of Nigeria introduced Cashless Policy. The aim was to also drive the development and modernization of payment system in line with Nigeria's Vision 2020 goal of being amongst the top 20 economies by the year 2020.

Over the years, the government and monetary authorities have introduced varying policies aimed at deepening financial inclusion within the economy. The policies ranged from various institutional involvements such as the establishment of community and microfinance banks to specific policies and programmes designed to facilitate access of the financially excluded to formal financial services. The private banks, on the other hand, have also been engaged in innovations and activities aimed at getting more people involved in the financial inclusion process, though their level of involvement have always been moderated to the extent that profitability is enhanced.

The economy of a nation may not develop on the whole when poor people are excluded and marginalized from the financial system because they are the real pillar of the economy. Therefore progression in financial inclusion should be one of the channels that can be used to make monetary policy to accomplish its goals; More so, when financial inclusion is a way of discouraging savings, loans and holding of money in the informal sector outside the financial system.

Most studies have focused on the effect of financial inclusion on growth, income inequality, and poverty reduction. The previous studies therefore measured the impact of a program (financial inclusion) on a policy. There are limited studies on the impact of monetary policy on financial inclusion. In order to make this study more indicative and different from other previous works, the main aim is to measure the impact of monetary policy with emphasis on financial inclusion indices such as deposit of rural banks, volume of loan of rural banks, number of bank branches, credit to individuals, ratio of money supply to Gross Domestic Product, volume of savings to Gross Domestic Product.

1.2. Research Questions

The following are the research questions of the study:

- What is the relationship between money supply and financial inclusion?
- Is there any relationship between the channels of monetary policy transmission and financial inclusion?
- Which monetary policy target variable affects financial inclusion most in Nigeria?

1.3. Objectives of the Study

The main aim of this study is to analyze the impact of monetary policy variable indicators on financial inclusion in Nigeria between 1981 and 2016 with the following specific objectives:

- To assess the relationship between money supply and financial inclusion indicators during the study period 1981-2016.
- To evaluate the relationship between monetary policy transmission channels and financial inclusion
- To investigate the monetary policy target variable that affects financial inclusion most in Nigeria between 1981 and 2016.

1.4. Hypotheses of the Study

The following are the hypotheses of the study:

Ho_1: There is no significant relationship between the level of money supply and financial inclusion.

Ho_2: There is no significant relationship between credit volume and financial inclusion.

Ho_3: There is no significant relationship between liquidity ratio and financial inclusion.

2.0. LITERATURE REVIEW

Financial Inclusion has become topical on the global policy agenda, but there are limited studies on the effect of monetary policy on financial inclusion. Nevertheless, in this section, related economic theories reviewed include; finance-growth nexus and financial intermediation.

2.1. Finance-Growth Nexus Theory

According to Aduda (2012), theories on the finance growth nexus advocate that financial development creates a productive environment for growth through 'supply leading' or 'demand-following' effect. The theory also perceives the lack of access to finance as a critical factor responsible for persistent income inequality as well as slower growth. Therefore, access to safe, easy and affordable source of finance is recognized as a pre-condition for accelerating growth and reducing income disparities and poverty which creates equal opportunities, enables economically and socially excluded people to integrate better into the economy and actively contribute to development and protect themselves against economic shocks (Serrao, Sequeria and Varambally (2013).

Theoretical disagreements do exist about the role of financial systems in economic growth. Some economists see the role as minor or negligible while others see it as significant. The demand following view is supported argues that the financial system does not spur economic growth; rather the financial system simply responds to development in the real sector. The supply leading proponents contrasts the former view. The origin of the finance-led growth hypothesis can be traced back to Bagehot (1873). Those who favor the finance-led growth hypothesis argue that the existence of an energetic financial sector has growth-enhancing effects. They posited that banks enable an economy to grow by providing efficient markets for funds. Levine and Zervos (1998), and others also emphasized the positive role of financial systems in economic growth. The main argument of proponents of the supply leading theory is that, financial markets evolve in response to increased demands for financial services from an already budding economy. Therefore, the development of

financial markets is a reflection of growth in other sectors of the economy.

According to Levine (2004), financial development facilitates economic growth through five channels and these are; producing information and capital allocation, monitoring firms and exerting corporate governance, improving risk management, polling of savings and facilitating the exchange of goods and services. Each of these functions can also manipulate the financial savings, investment decisions and economic growth.

One of the important functions of the financial system is to assist capital flows from savers to the highest return investment (Levine 2006). Financial intermediaries and companies have a close relationship, further reducing the cost of obtaining information. Imperfect information may, in turn, ease external financing problems and a better allocation of resources. Financial markets and institutions promote improvements in the control of the company and a rapid accumulation of capital and promote economic growth through better allocation of capital. An additional function of financial institutions is to reduce the cost of acquiring information and monitoring of investment projects.

Diamond (1984) developed the model of financial development based on reducing the cost of monitoring information, which is useful for solving the problems on incentives between borrowers and lenders5. It provides incentives for the characterization of the cost of delegated supervision of financial intermediaries. Diversification reduces the costs even in risk neutral economy. The model presents a general analysis of the diversification effect on solving problems and assumed debt contracts in costly bankruptcy are shown to be optimal. Financial development allows better contracts to be used and allow Pareto superior allocation.

Greenwood and Smith (1997) analyzed that financial intermediation and economic growth are determined endogenously. Financial intermediation promotes economic growth because it provides a higher rate of return on equity, and in turn it allocates resources. Their model investigated that the capital may be invested for getting a low-yield technology or high-yield technology. Low yield technology is safe and get low rate of return, but the high-yield technology is risky and investors get the high rate of return. There are two terms for the high rate of return on risky technology such as cumulative shock and particular project shock. Unlike their large portfolios of individual investors by financial intermediaries can perfectly decode the aggregate productivity shock and therefore, to choose the best technology for the current perception of the shock. Therefore, financial intermediaries, savings and productivity through more efficient allocation of capital lead to greater economic growth.

2.2. Financial Intermediation Theory

Nwite (2014) stated that financial intermediaries through the process of financial intermediation mobilize deposits from depositors and allocate credit facilities to borrowers for investments that will lead to economic development. He examined the effect of financial intermediation on economic development in Nigeria by using ordinary least square estimate. This study concluded that there was long run relationship between credit to private sector, lending rate, interest rate margin and economic growth in Nigeria. The study found that from 2004 to 2007, the period recorded the highest average annual growth rate in loan disbursement to the private sector, yet the same period recorded the worst average annual growth rate in the manufacturing capacity utilization rate. The study concluded that there was a significant and positive effect of financial intermediation on economic development in Nigeria. He recommended that Nigerian government should ensure that a component analysis of the real sector of the Nigerian economy be carried out with a view to having a better understanding of the inverse relationship between the loans to the private sector and the performance of

Nigerian economy through financial intermediation. He also advised Central Bank of Nigeria to check mate banks from possessing excess liquidity that would ensure the prevention of inflation in the economy and that there should be a regulatory frame work that will enable the financial institutions to channel their resources to the most viable sector of the economy so as to increase the level of economic development.

Andrew and Osuji (2013) state that financial intermediation involves the transformation of mobilized deposits liabilities by banks into banks assets or credits such as loans and overdraft. This means that financial intermediation is the process of taking in money from depositors and lending same to borrowers for investments which in turn help the economy to grow. Efficient financial intermediation causes high level of employment generation and income which invariably enhances the level of economic development.

Basher (2013) opined that financial intermediation play a very vital role in economic development in Nigeria. For financial intermediation to aid development, there must be an efficient financial system. This means that financial intermediation mitigates the costs associated with information acquisition and the conduct of financial transactions through the level of lending rate and credit to private sector in accelerating development in an economy. Basher (2013) examined the linkage between open markets, financial sector development and economic growth to know if markets along with financial sector development affect economic growth in Nigeria. The study made use of Granger causality test, Johansen cointegration test and vector error correction model. It was found that the causation between open markets, financial sector development and growth in Nigeria is weak and insignificant, and such cannot be used to forecast economic growth in Nigeria.

Thus, to summarize, according to the modern theory of financial intermediation, financial intermediaries are active because market imperfections prevent savers and investors from trading directly with each other in an optimal way. The most important market imperfections are the informational asymmetries between savers and investors. Financial intermediaries, banks specifically, fill – as agents and as delegated monitors – information gaps between ultimate savers and investors. This is because they have a comparative informational advantage over ultimate savers and investors. They screen and monitor investors on behalf of savers. This is their basic function, which justifies the transaction costs they charge to parties. They also bridge the maturity mismatch between savers and investors and facilitate payments between economic parties by providing a payment, settlement and clearing system. Consequently, they engage in qualitative asset transformation activities. To ensure the sustainability of financial intermediation, safety and soundness regulation has to be put in place. The regulation also provides the basis for the intermediaries to enact in the production of their monetary services. All studies on the reasons behind the financial intermediation focus on the functioning of intermediaries in the intermediation process; they do not examine the existence of the real-world intermediaries as such. It appears that the latter issue is regarded to be dealt with when satisfactory answers on the former are being provided. Market optimization is the main point of reference in case of the functioning of the intermediaries.

An important question that the theory tries to answer is why do investors first lend to banks who then lend to borrowers, instead of lending directly? Arguments point out to the fact that banks are able to effectively monitor borrowers and thus play the role of delegated monitoring

2.3. Monetary Policy Rule and Financial Inclusion

According to Yetman (2017), an increase in the level of financial inclusion is likely to influence the reaction

function, or monetary policy rule, that the central bank wishes to pursue. He stated that the monetary policy rule can either needs to change in order to ensure determinacy or the monetary policy rule should change in order to ensure optimality. In explaining how the monetary policy rule might need to change to ensure determinacy, Yetman (2017) noted that an important criterion for an effective monetary policy rule is that it does not create instability in the economy. Clear examples of unstable monetary policy rules in the real world are rare, perhaps with the exception of hyperinflations. This could be because central banks are able to observe the consequences of their policy choices in a timely enough manner that they can adjust their course of action if the outcomes are undesirable.

Within a modelling environment, central banks are often assumed to follow a particular monetary policy rule, regardless of the shocks that the economy faces. In such an environment, a minimal requirement for a desirable rule is that the model remains deterministic, so that the economy moves back towards the equilibrium after being subjected to a shock. Within a very simple New Keynesian model where prices are set in part based on expected future inflation, a common requirement for determinism is that the monetary policy rule satisfies what has become known as the "Taylor Principle", which is the idea that nominal policy rates rise at least one-for-one with inflation so that real interest rates are increasing in the inflation rate (Taylor (1999). In the original formulation of the Taylor Rule, for example, the coefficient on inflation was around 1.5. Since real interest rates are a key driver of aggregate demand, the Taylor Principle ensures that the policy response to overheating economy helps to slow aggregate demand, and also that expansionary policy in response to a slowdown is sufficient to stimulate demand. In most such models, the (sometimes implicit) assumption is that all agents and firms are financially included.

A number of authors have addressed how the requirement for determinacy varies with the level of financial inclusion. A common framework used to address this issue was examined by Galí and Vales (2004), where they modelled the economy as consisting some conventional agents, who have access to financial markets, and others (labelled "rule-of-thumb" consumers), who neither save nor borrow but instead simply consume their full labour income. The authors solved for the range of parameter values for a Taylor-type rule that yield dynamic stability and uniqueness, and show that this depends critically on the share of households with access to financial markets. If the policy rule responds to contemporaneous values of output and inflation, then a greater response to inflation is required in order to generate a unique solution the smaller is the portion of financially included households. And if the policy rule is forward looking, a sufficiently large share of hand-to-mouth consumers may result in no locally unique equilibrium at all.

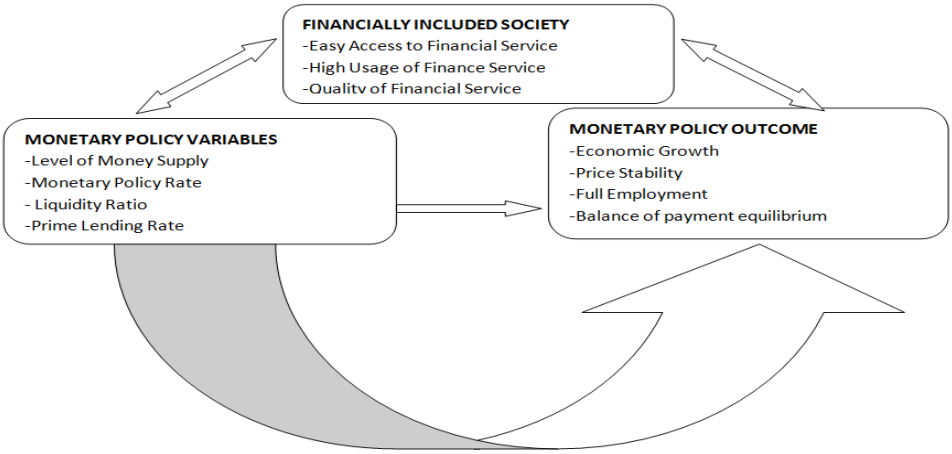
Many subsequent papers built on Galí et al (2004), and demonstrated directions along which these results were sensitive. One key reason why monetary policy rules may become destabilising as the level of financial inclusion falls was that excluded consumers were not directly affected by interest rates, rendering monetary policy less effective (as discussed in Section 3 above). However, Di Bartolomeo and Rossi (2007) argued that a low level of financial inclusion does not reduce monetary policy effectiveness by as much as one might expect since consumption demand is more income-sensitive for excluded households than included households. Monetary policy affects the consumption of included households, and hence the incomes of excluded households, creating an indirect policy channel that increases policy effectiveness. Such an effect is at work in Bilbiie (2008). In his model, if the portion of financially excluded households is sufficiently high then the "Taylor principle" may even become inverted. In such a case, optimal policy entails a passive monetary policy rule.

Yetman (2017) observed that another way to think about how the monetary policy rule should change with a change in the level of financial inclusion is to focus on optimality. The approach was to do welfare analysis within a

theoretical model and see how the monetary policy response to variables should change with the level of financial inclusion in order for welfare to be maximised.

Mehrotra and Yetman (2014) built on the Galí et al (2004) model, in which financial excluded consumers were assumed to simply consume all their income each period, while included consumers have access to financial markets. They examined the effects of two different kinds of shocks to the economy: a (real) productivity shock, and a (nominal) price shock. Based on a calibration of their model, they were able to show that, in response to either shock, optimal monetary policy implies that there should be a positive relationship between the level of financial inclusion and the ratio of output volatility to inflation volatility. They were able to prefer an answer to what they believed was driven of the relationship by comparing what the relationship between financial inclusion and the same ratio would look like if the central bank followed a simple monetary policy rule instead.

There are two complementary reasons why we might expect optimal monetary policy to vary as the share of consumers who are financially included increases. First, this change influences the structure of the economy. More included consumers implies larger changes in investment (which is effectively what adjusts when included consumers adjust their savings in response to shocks), and hence output. Second, welfare in these models can be thought of as depending on the volatility of both consumption and inflation. For excluded consumers, consumption volatility and output volatility co-move strongly, so reducing consumption volatility requires reducing output volatility. For included consumers, the link between the two is much weaker, since included consumers can use their access to financial markets to adjust consumption levels relative to income levels. But for all consumers, inflation volatility is costly. Clearly, in such a model, the greater is the share of included consumers, who are able to stabilise their consumption even if output is volatile, the less need there is for the central bank to stabilise output to achieve optimal outcomes. Thus the central bank will adjust its policy rule to increase the stability of inflation, even if it comes at the expense of somewhat higher output volatility.



Source: Adapted from Onaolapo 2015

Figure 2.1: Linkages between Monetary Policy and Financial Inclusion

3.0. METHODOLOGY

The study used mainly secondary data from many sources. Data were gathered from the Central Bank of Nigeria, on The Annual Time Series data on Money Supply (Narrow and Broad Money), Gross Domestic Product, Commercial Bank Lending rate, Loan Portfolio of Banks, Volume of Bank deposit, Number of branches of commercial bank, and so on.

In assessing the relationship between monetary policy transmission mechanisms and financial inclusion, Cointegration and Error Correction Model were used. A two-step approach to testing for causality or cointegration between Financial Inclusion (FI) and Monetary Policy (MP) was followed. The first step requires a determination of the time series properties of each variable based on unit root tests. This was accomplished by performing the augmented Dickey-Fuller (ADF) test. The ADF test was based on the regression equation with the inclusion of a cosnstant.

For this study; MP represents the index of Monetary Policy Transmission Mechanisms with the following variables:

MP_1 = MPR (Monetary Policy Rate) ; $MP_{2=}$ M_2 (Money Supply); $MP_{3=}$ LR (Liquidity Ratio)

$MP_{4=}$ Total Loan and Advances (TLA); $MP_{5=}$ PLR (Prime Lending Rate)

FI represents the index of Financial Inclusion with the following variables:

FI_1 = Deposit of Rural Banks =X_1; FI_2= Loan of Rural Banks= X_2; FI_3 = Number of Bank Branches= X_3; FI_4= Number Individuals with bank accounts= X_4 ; FI_5= Number of ATMs per 100,000 adults= X_5

The model below was specified to analyse the relationship between Money supply and Financial inclusion.

$Ms= f(X_1, X_2, X_3, X_4, X_5, u)$ (1)

The model below was used to investigate the monetary policy indicator that affected financial inclusion most in Nigeria during the study period.

$X_i = f(MP_i u)$ (2)

Where $X_i = M_2/GDP$ i.e Money Supply/Gross Domestic Product

MP_i= Monetary Policy Indicators

4.0 RESULTS

The result of econometric model estimated to assess the relationship between money supply and financial inclusion indicators were presented below:

Table 4.1: Ordinary Least Square Result- Relationship Between Money Supply and Financial Inclusion

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X1)-Deposit	-0.013141	0.008369	-1.5702	0.1276
D(X2)-Loans	0.011587	0.002491	4.6507**	0.0001
D(X3)-Branches	0.260280	0.150130	1.7337*	0.0940
D(X4)-Individuals	0.383818	0.086696	4.4271**	0.0001
D(X5)-ATM	0.537560	0.149105	3.6052**	0.0012
R-squared	0.618873	Mean dependent var		0.211027
Adjusted R-squared	0.550815	S.D. dependent var		0.110812
S.E. of regression	0.074268	Akaike info criterion		-2.203501
Sum squared resid	0.154439	Schwarz criterion		-1.934143
Log likelihood	43.45951	Hannan-Quinn criter.		-2.111642
Durbin-Watson stat	1.220396			

T Statistical values at 5%= 2.1; at 10%= 1.7

Source: Author's Computation

Table 4.1 shows that within the study period, financial inclusion indicators such as total loan of rural banks, number of bank branches, number of individuals with bank accounts and number of ATMs/100,000 adults show significant positive relationship with money supply. The values of the coefficient of multiple determination (55%) and Durbin Watson Statistics were within the acceptable range. With this result, the null hypothesis ($H0_1$) stating no relationship between money supply and financial inclusion was rejected.

4.2 Relationship between Monetary Policy Transmission Channels and Financial Inclusion

In order to assess the relationship between monetary policy transmission mechanisms and financial inclusion, Cointegration and Error Correction Model were used. The result of the Unit test is shown in Table 4.2

Table 4.2: Unit Root Tests

Variable	Augmented Dickey-Fuller (ADF)		Phillip Perron (PP)		Decision
	Level	First Difference	Level	First Difference	
MP1	-3.0304**	-7.9819*	-2.9894**	-8.3407*	I(0)
MP2	1.4233	-0.4432	5.0776	-3.8031**	I(1)
MP3	-3.5369**	-6.3307*	-3.5200**	-11.1267*	I(0)
MP4	10.4587	11.5603	3.3377	-4.4675*	I(1)
MP5	-3.3746**	-5.7120*	-3.3343**	-9.2553*	I(0)
X1	0.0214	-3.0346*	0.0909	-3.0346*	I(1)
X2	2.5985	-1.5319	-4.5351*	-8.3744*	I(0)
X3	-0.1380	-4.4021*	-0.2296	-4.4234*	I(1)
X4	3.2662	-1.5096	4.4814	0.0641**	I(1)
X5	-0.8096	-5.1961*	-0.9087	-5.2763*	I(1)
X6	-2.2072	-6.2556*	-2.2269	-7.0734*	I(1)
Y	-3.2458**	-0.2253	6.8475	-1.2172	I(0)

Source: Authors' computation;
Note: *, ** and *** imply statistical significance at 1%, 5% and 10% levels respectively.

The above Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) were conducted to evade the problems of spurious results which are connected with non-stationary time series. The tests were considered appropriate as a prior diagnostic test before the estimation of models. The variables were integrated of order 0 and 1.

Table 4.3: Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.833346	168.0622	125.6154	0.0000
At most 1 *	0.679552	108.9316	95.75366	0.0045
At most 2 *	0.494180	71.37644	69.81889	0.0374
At most 3 *	0.443416	48.88449	47.85613	0.0399
At most 4	0.332056	29.54855	29.79707	0.0534
At most 5 *	0.224965	16.23137	15.49471	0.0387
Trace test indicates 4 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
Trend assumption: Linear deterministic trend				

Source: Authors'Computation

Table 4.4: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.833346	59.13065	46.23142	0.0013
At most 1	0.679552	37.55513	40.07757	0.0937
At most 2	0.494180	22.49196	33.87687	0.5696

At most 3	0.443416	19.33594	27.58434	0.3890
At most 4	0.332056	13.31718	21.13162	0.4235
At most 5	0.224965	8.409962	14.26460	0.3386
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Authors'Computation

The time series properties of financial inclusion indicators and monetary policy transmission mechanisms are represented in graphical forms. From Figure 4.1, the graphical illustration of the trend in money supply had a good fit with coefficient of determination (R^2) of 67 percent. All other transmission channels such as Monetary Policy Rate (MPR), Liquidity Ratio (LR), Prime Lending Rate (PLR) and Loans and Advances had very low coefficient of determination (R^2). Figure 4.2 shows the time series properties of the indicators of financial inclusion, the coefficient of determination (R^2) of Money Supply/GDP was 0.65%; that of Credit to Individuals was 0.62%, for the number of bank branches, the R^2 was 0.87%.

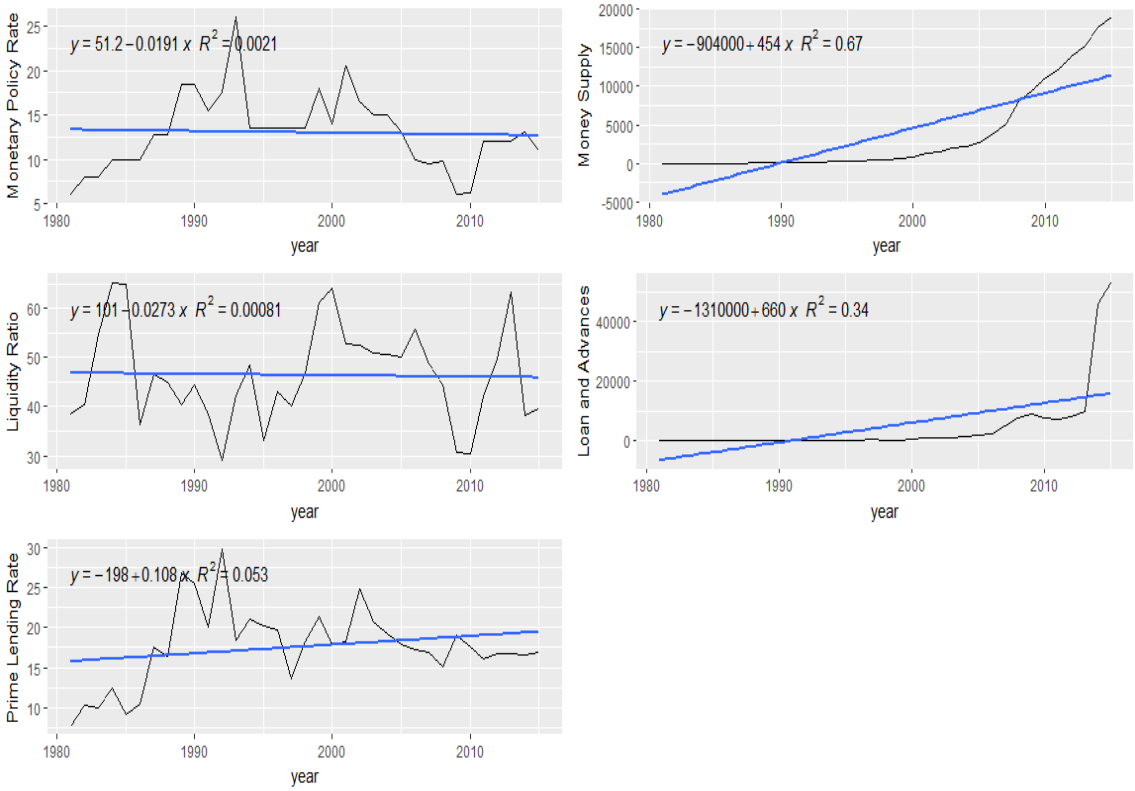


Figure 4.1: Monetary Policy Transmission Variables (1981-2016)

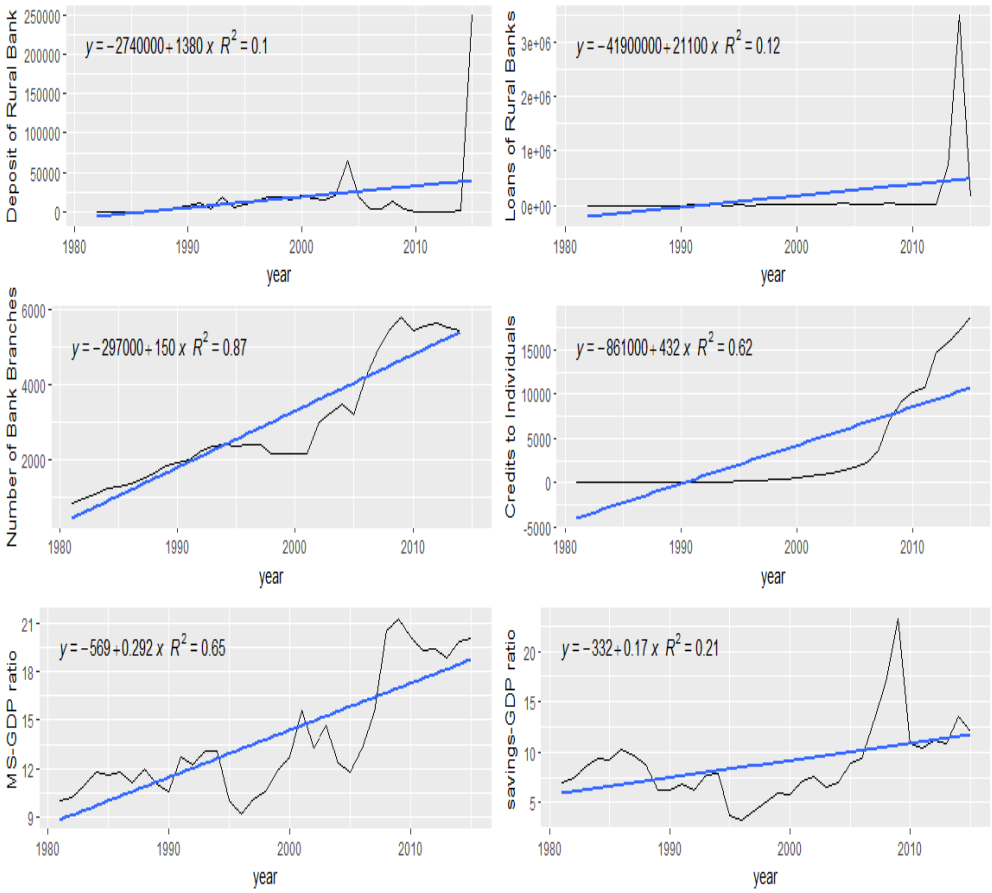


Figure 4.2: Indicators of Financial Inclusion

Table 4.5: Ordinary Least Square Result of the Effect of Monetary Policy Indicators on Financial Inclusion

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MP1)	0.093967	0.145198	0.647165	0.5226
MP2	0.089332	0.016103	5.547608**	0.0000
MP3	0.413714	0.077964	5.906484**	0.0000
D(MP4)	0.015888	0.118965	0.133553	0.8947
MP5	0.154723	0.109048	1.418851	0.1666
R-squared	0.597516	Mean dependent var		2.600603
Adjusted R-squared	0.514415	S.D. dependent var		0.249364
S.E. of regression	0.206474	Akaike info criterion		-0.182235
Sum squared resid	1.236309	Schwarz criterion		0.042230
Log likelihood	8.097997	Hannan-Quinn criter.		-0.105686
Durbin-Watson stat	1.609319			

Source: Author's Computation

From Table 4.5, the coefficients of Money Supply (MP_2) and Liquidity Ratio (MP_3)show that the variables had significant coefficients using t statistics. The coefficient of monetary policy rate (MP_1) was not significant. The coefficient of Total Loan and Advances was also not significant. For the model, the adjusted R^2 was 51% and Durbin Watson Statistics was 1.6. While rejecting the null hypotheis (Ho_3) that there is no significant relationship between liquidity ratio and financial inclusion, the null hypothesis (Ho_2) is validated that there is no significant relationship between credit volume and financial inclusion. The result revealed that Liquidity ratio was the monetary policy target variable that affect financial inclusion most during the period under review.

5.0. CONCLUSIONS

This paper examined the impact of monetary policy variable indicators on financial inclusion in Nigeria between 1981 and 2016. Findings revealed that significant relationships existed between money supply and financial inclusion. The results also showed that there was no significant relationship between credit volume and financial inclusion indices. Also, liquidity ratio was the monetary policy target variable that affected financial inclusion most during the period under review.

Based on the outcome of this study, we hereby recommend that Central Bank of Nigeria (CBN) should introduce differentiated Liquidity ratio for deposit money banks with more rural branches as a way of encouraging these banks in promoting financial inclusion. The apex bank needs to introduce more policies towards enhancing financial inclusion in Nigeria as well as policies supporting the growth and stability of the financial sector.

REFERENCES

1. *Adigun, M., and Kama, U.(2013). "Financial Inclusion in Nigeria: Issues and Challenges, An Occasional Paper No 45 Central Bank of Nigeria.*
2. *Aduda J. Kalunda E (2012) "Financial Inclusion and Financial Sector Stability With Reference to Kenya" Journal of Applied Finance & Banking, vol. 2, no. 6, 2012, 95-120 ISSN: 1792-6580 (print version), 1792-6599 (online) Scienpress.*
3. *Aina, S., and Oluyombo, O. (2014)."The Economy of Financial Inclusion in Nigeria: Theory, Practice and Policy". Proshare Publishers pp10-30.*
4. *Ajayi, S.I., and Ojo, O.O. (2006). "Money and Banking, Analysis and Policy in the Nigerian Context", Second Edition Published by Daily Graphics Nigeria Limited 249-315.*
5. *Andrew, O.A. and Osuji, C. C. (2013). "An Empirical Analysis of Trends in Financial Intermediation and Output in Nigeria". Global Journals Inc.(USA), 13(9): 210-216.*
6. *Bagehot, W, (1873). "Lombard Street: A Description of the Money Market. Homewood", IL: Richard D. Irwin (1962 Edition)*
7. *Basher, O. K. (2013), Open Market, Financial Sector Development and Economic Growth in Nigeria. European Scientific Journal. 8(28): 80-85.*
8. *Bilbiie, F (2008): "Limited asset markets participation, monetary policy and (inverted) aggregate demand logic," Journal of Economic Theory 140(1), 162–196.*
9. *Central Bank of Nigeria (2003) Know Your Customer Manual for Banks and Other Financial Institutions in Nigeria. Available from http://www.cenbank.org/OUT/PUBLICATIONS/BSD/2003/KYCM.PDF.*
10. *Central Bank of Nigeria (2018): Exposure Draft of the National Financial Inclusion Strategy Refresh. Doc Ref: DFD/FIS/GEN/ODB/08/035, www.cbn.gov.ng.*
11. *Central Bank of Nigeria (2017) Statistical Bulletin-Central Bank of Nigeria from https://www.cbn.gov.ng/.../.../2017/.../ecopy%20of%202016%20statistical%20bulletin_fi*
12. *Central Bank of Nigeria (2010). Standards and Guidelines on Automated Teller Machine (ATM) Operations in Nigeria. Available from: http://www.cenbank.org/out/2010/circulars/bspd/atm%20standards%201.pdf.*
13. *Central Bank of Nigeria (2011). Understanding Monetary Policy. Series No1. What is MonetaryPolicy 2011. CBN/MPD/Series/01/2011. www.cbn.org.*

14. *Central Bank of Nigeria (2011). Revised Microfinance Policy Framework for Nigeria. Available from: http://www.cenbank.org/Out/2011/pressrelease/gvd/Revised%20Microfinance Policy July 2012.pdf.*
15. *Central Bank of Nigeria (2009). Microfinance Policy Framework, Available from:*

    http://www.cenbank.org/out/Publications/guidelines/dfd/2006/microfinance%20policy.pd
16. *Central Bank of Nigeria (2008). Central Bank of Nigeria (CBN), Monetary Policy Department Series 1,2008.CBN/MPD/Series/01/2008. www.cbn.org*
17. *Central Bank of Nigeria Regulatory Framework for Mobile Payments Services in Nigeria. Available from:*

    http://www.cenbank.org/OUT/CIRCULARS/BOD/2009/REGULATORY%20FRAMEWORK%20%20FOR%20MOBILE%20PAYMENTS%20SERVICES%20IN%20NIGERIA.PDF
18. *Central Bank of Nigeria. FSS 2020 Blueprint for Nigeria's financial system, Financial Derivatives Company. Available from: http://www.cgap.org/gm/document 1.1.1703/Nigeria%20-FSS%202020.pdf.*
19. *Toby, A. (2014). Working capital management policy and corporate profitability of Nigerian quoted companies: A sectoral analysis. International Journal of Financial Management, 3(1), 9-20.*
20. *CGAP (2009) Information Systems for Micro Finance Institutions. Available from:*

    www.cgap.org/gm/document1.9.34358/CGAP%20Information%20Systems%20Course.
21. *CGAP(2009) MIV SURVEY Available from: http://www.cgap.org/gm/document-1.9.37549/*
22. *CGAP%20MIV%20Survey%20-%20Results%20Presentation.pdfNCGAP(2012). Financial Inclusion and Stability: What Does Research Show? Retrieved fromhttp://www.cgap.org/sites/default/files/CGAPBrief-Financial-Inclusion-and-Stability-What-Does-Research-ShowMay-2012.pdf.*
23. *CGAP and World Bank (2010).“Financial Access 2010: The State of Financial Inclusion Through the Crisis”. Washington, DC: World Bank.*
24. *Demirguc-Kunt, A and L Klapper (2012): “Measuring financial inclusion: The Global Findex database,” World Bank Policy Research Working Paper Series no 6025.*
25. *Demirgüç-Kunt,A; Thorsten B, Patrick., (2012).“Policies and Pitfalls in Expanding Access Washington, DC”: World Bank wp 0604.*
26. *Diamond, D. W, (1984). “Financial Intermediation and Delegated Monitoring”, Review of Economic Studies 51, pp.393-414.*
27. *Di Bartolomeo, G and L Rossi (2007): “Effectiveness of monetary policy and limited asset market participation: Neoclassical versus Keynesian effects,” International Journal of Economic Theory 3(3), 213–218.*
28. *EFInA (2008 & 2010).Access to Financial services in Nigeria. Available from*

    www.efina.org.ng/assets/Documents/EFInAAccess-to-Financial-Services-in Nigeria 2010 surveyKey Findings.pdf?phpMyAdmin=%2CWvBxPNpx0z2BcKe8h2UcHJI%2CXb.
29. *Galí, J, J López-Salido and Vallés, J (2004): “Rule-of-thumb consumers and the design of interest rate rules,” Journal of Money, Credit and Banking 36(4), 739–763.*
30. *Greenwood, J. and Smith, B, (1997). “Financial Markets in Development, and the Development of Financial Markets”, Journal of Economic Dynamics and Control 21, pp. 145-181.*

31. *King, R. G. and Levine, R, (1998). "Finance and Growth: Schumpeter Might be Right", Quarterly Journal of Economics (108:3), pp. 717-737.*
32. *Mizal, Kamarul., Fabeil, N. F., & Pazim, K. H. (2014). Financial sustainability of community-based tourism (CBT): The case of tourism cooperative limited (KOPEL BERHAD). International Journal of Research in Business Management, 2(1), 23-32.*
33. *Laeven, L. and Levine, R, (2008). "Complex Ownership Structures and Corporate Valuations", Review of Financial Studies 21, pp.579-604.*
34. *Lapukeni A.F; (2015) "The Impact of Financial Inclusion on Monetary Policy Effectiveness: The case of Malawi" International Journal of Monetary Economics and Finance, Vol. 8, No. 4.*
35. *Levine, Ross, (2006). "Finance and Growth: Theory and Evidence in Handbook of Economic Growth", Eds: Philippe Aghion and Steven Durlauf, New York: Elsevier North-Holland, pp. 865-934.*
36. *Levine, Ross, (2004). "Finance and Growth: Theory and Evidence", National Bureau of Economic Research (NBER), WP 10766.*
37. *Levine, R. and S. Zervos, (1998). "Stock Markets, Banks, and Economic Growth", American Economic Review (88:3), pp. 537-558.*
38. *Mbutor, M. O. and Uba, I. A. (2013)."The Impact of Financial Inclusion on Monetary policy in Nigeria". Journal of Economic and International Finance. Vol. 5 (8). Pp. 318-326.*
39. *Mehrotra, A and J Yetman (2014): "Financial inclusion and optimal monetary policy," BIS Working Papers No 476.*
40. *Nwite, S.C. (2014). "Determinants Of Financial Intermediation And Its Implications On Economic Growth In Nigeria" British Journal of Marketing Studies Vol.3, No.9, pp.49-56, December 2014.*
41. *Onaolapo A.R (2015) "Effects of Financial Inclusion on the Economic Growth of Nigeria (1982-2012)" International Journal of Business and Management Review Vol.3, No.8, pp.11-28.*
42. *Serrao, M. V., Sequeira, A. Hmoo and Varambally, K. V. M. (2013)."Conceptual Framework to investigate the Accessibility and Impact of Financial Inclusion". Indian Journal of Research. Vol. 2 (9). Pp. 47-49*
43. *Frimpong, F. K. S. (2014). The Impact of Elements of the Market Communication Mix on Customers' Service Quality Perceptions: A Financial Sector Perspective. International Journal of Sales & Marketing Management Research and Development, 4(3), 37-58.*
44. *Taylor, J (1999): "A historical analysis of monetary policy rules," in Monetary policy rules(J Taylor, ed), University of Chicago Press, 319-348.*
45. *Usman, O.A and Adejare, A.T (2014) "Money Supply, Foreign Exchange Regimes And Economic Growth In Nigeria" Journal of Finance and Accounting Vol.5, No.8, ISSN 2222-1697.*
46. *Usman, O.A and Adejare, A.T (2014)" Impact of Monetary Policy on Industrial Growth in Nigeria" International Journal of Academic Research in Business and Social Sciences Vol. 4, No. 1 ISSN: 2222-6990 18 www.hrmars.com/journals.*
47. *Yetman (2017), "Adapting monetary policy to increasing financial inclusion" Bank for International Settlements, Seminar at the ISI World Statistics Congress on "Financial Inclusion" Bank of Morocco – CEMLA – IFC Satellite Marrakech, Morocco, July 14, 2017*